Chapter Four:

How Effective are Passive Alcohol Sensors in the Law Enforcement Environment?

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Effectiveness of Passive Alcohol Sensors

The determination of "effectiveness" of passive alcohol sensors is measured by various standards depending on how law enforcement uses the device and how "effectiveness" is perceived.

Originally, "effectiveness" for the purpose of this study was defined as the ability of a passive alcohol sensor to *enhance* an officer's ability to sense the presence of alcohol and enhance the officer's job performance. This definition also includes a consideration for how *accurate* the device is. However, further study and discussion resulted in additional considerations in determining "effectiveness". For law enforcement, effectiveness can also be defined in terms of how *practical* the device is in the context of the officer's routine; that is if the device is convenient to carry on the officer's belt or in the officer's vehicle, and if it is easy to use during a traffic stop. For policy makers, effectiveness may be measured in terms of *providing deterrence* from impaired driving or enhancing public relations.

To identify perceptions focusing on the "effectiveness" of passive alcohol sensors, the study included discussions from the two focus groups formed by WisDOT to study passive alcohol sensors.

The **Law Enforcement Focus Group** met on September 4, 2002, and included law enforcement officers and officials representing all areas of the state. Some of the participants had used, or are currently using, passive alcohol sensors and some had knowledge of the devices but had not used them for enforcement (a complete list of participants is provided in Appendix C). The focus group's identification of the effectiveness of passive alcohol sensors included the following comments:

Overall Effectiveness

- Passive alcohol sensors are not as cost-effective as other tools (e.g., evidential and preliminary breath testers/PBTs), but agencies should be permitted to "keep their options open."
- Passive alcohol sensors may be too costly when considered in times of budget constraints and other costs.
- Do not ban the use of passive alcohol sensors; there are some instances where they may be useful.
- The decision of "effectiveness" should be left up to each individual law enforcement agency. The device is not necessarily economical for all agencies or all officers, so the decision of their effectiveness is an element of different law enforcement environments.

- Passive alcohol sensors can provide a "perception of enforcement" similar to that provided by marked law enforcement vehicles on a highway that indicate a police presence.
- Passive alcohol sensors may not be as well accepted by the general public, and thus less effective, as other law enforcement technology. The public is more accustomed to accepted law enforcement tools such as the Intoximeter EC/IR and PBT's.
- Passive alcohol sensors are less intrusive than other tools, requiring less contact with the public, and thus are more acceptable.
- The perception of accuracy of the devices varies:

    Some agencies state that the devices are "good" or "useful."

    Some agencies no longer use the devices due to consistently inaccurate readings.

    One agency reports that officers using the device have outperformed officers not using the device by a ratio of 2-1.

    There is *uncertainty* as to the accuracy of the devices.

    Problems with accuracy arise when using the devices incorrectly, such as using a cleanings alcohol-based hand gel; there are reports of false readings under those circumstances.

    The devices may not add any "value" to the traffic stop.

- Passive alcohol sensors have limited use; they do not measure alcohol levels nor determine impairment due to alcohol.
- The passive alcohol sensors may not be any more accurate than the officer's nose.
- Passive alcohol sensors may be useful in detecting odors when the officer has limitations due to colds or illness, or when other odors (e.g. offensive body odor due to uncleanliness or medical condition) mask the alcohol.
- Environmental conditions compromise the accuracy of passive alcohol sensors. Wind and cold experienced alongside a highway can affect sensor readings. Snowmobile OWI enforcement can create problems related to excessive wind, cold and operator helmets that restrict the ambient alcohol, resulting in inaccurate readings. Boat OWI enforcement is hampered by wind and gasoline odors that can affect readings.

    Staff note: In general, passive alcohol sensors can be operated at temperatures ranging between 0 and 105 degrees Fahrenheit depending upon manufacturer recommendations. Thus, Wisconsin weather extremes (i.e., temperatures below zero) can become a factor affecting the accuracy of some of the devices when used at traffic stops.

In summary, the law enforcement focus group generally was not certain that passive alcohol sensors could perform accurately in most conditions, if they were "cost effective" in relation to other available tools, or if they were effective in regards to public deterrence. However, the group was not ready to ban the devices based on the overall standards of accuracy and effectiveness, but rather would leave that decision up to each individual law enforcement agency or community.

A further discussion of the accuracy of the individual passive alcohol sensors is provided in the Chemical Test Section report found in Appendix A. In that report, laboratory and human test results reported some "false positives" with the devices.

Effectiveness in Terms of Practicality

When the law enforcement focus group considered the practicality of the devices, their consideration was in terms of space, both on the officer's person and in the officer's vehicle, as well as accessibility and use during a traffic stop.

- The officer may require two flashlights if one is used as a passive alcohol sensor and one is used as an actual flashlight. The passive alcohol sensor that is combined with a flashlight displays too low of a light to be useful to the officer as a source of light.
- The passive alcohol sensor can be another piece of equipment to be carried on the officer's belt (depending on the type of device), adding weight to the belt and taking up room on the belt.
- Officers want to focus on the overall behavior of the violator, not the reading of a passive alcohol sensor when making a traffic stop.
- Use of passive alcohol sensors may compromise officer safety. Devices that are used close to the violator's face can be grabbed by the violator and used as a weapon against the officer or other persons.
- Flashlights are not routinely used during daylight hours, creating confusion for the violator if the passive alcohol sensor/flashlight combination is used during a daytime stop.
- As a result of publicity about the devices, some drivers may not roll down their windows during a traffic stop for fear of their use, which could be counterproductive for the officer.
- Carrying a passive alcohol sensor/clipboard combination may be cumbersome at traffic stops and may actually hinder the officer.

The **Legal Focus Group** met on September 11, 2002, and included representation from all elements of the legal environment, specifically defense attorneys, prosecutors, a judge, privacy advocates, and the Attorney General's Office (a complete list of participants is found in Appendix D). The focus group's identification of "effectiveness" of passive alcohol sensors included the following comments.

Overall Effectiveness

- The opportunities for use of passive alcohol sensors by law enforcement are very limited, suggesting that they would be used in only 1 out of every 30 OWI traffic stops.
- Even if the devices are used infrequently, any effect passive alcohol sensors may have against OWI is useful.
- Law enforcement officers already have the authority to smell alcohol, so use of a passive alcohol sensor as a deterrent is a "silly" concept.
- If the law enforcement officer has the opportunity to see or smell the conditions at a traffic stop, why is an additional tool necessary?
- Traffic stops are already traumatic for many motorists and the use of a passive alcohol sensor only makes it more traumatic, resulting in a negative response from the general public.
- Passive alcohol sensors may be no more intrusive than other tools used by law enforcement; they are just another inconvenience that may or may not be effective.
- The use of passive alcohol sensors may elevate the conflict between privacy advocates and efforts to reduce impaired driving.
- Passive alcohol sensors have minimal benefit related to the costs for purchase and training.
- Funds could be spent on other documented technologies to combat impaired driving.

Effectiveness in the Judicial System

- Arrests and convictions for OWI violations do not depend upon just one tool but rather the use of many tools and procedures.
- Use of passive alcohol sensors may create a need for absolute sobriety if legal alcohol is given the same status as illegal substances.
- Any decline in alcohol-related deaths is not reflective of the technology used by law enforcement, but rather is reflective of new laws, fines and court opinions related to OWI.
- Infrequent use will have little impact in reducing the number of OWI convictions.
- There is no real problem with law enforcement use of passive alcohol sensors since they are not permitted as evidence as part of an OWI court case.
- The credibility of the law enforcement officer may diminish if they need to use a tool to smell alcohol.
- For prosecutors, the use of a passive alcohol sensor may be more effort than they are worth.
- It may be too difficult to distinguish between variance of colors (of the passive alcohol sensor display) to argue in court.

In summary, the legal focus group, like the law enforcement focus group, suggested that though passive alcohol sensors may not be a particularly effective tool, they should not be banned in Wisconsin but rather remain available for those law enforcement agencies and communities who want to use them.

National Studies Focusing on the Effectiveness of Passive Alcohol Sensors

From the national perspective, effectiveness has been tested in several studies going back as far as 1983. A review of the literature suggests that the use of passive alcohol sensors by law enforcement has been met with "mixed results." For example, there is data suggesting good results in the field (in terms of "ability to detect," "assistance with making the arrest," and "deterring drinking and driving") as well as less-than-optimal results ("problems in the environment," "inability to detect at lower BAC levels," "problems with detection due to performance" and "problems establishing statistical significance").

The following is an annotated listing of studies that focus on the effectiveness of passive alcohol sensors as an enforcement tool in different states. The studies were collected from the Insurance Institute of Highway Safety Website (indicated by asterisk *), the Michigan Department of Highway Safety and planning as well as from other sources.

The Michigan Experience – Excerpts Courtesy of the Michigan Office of Highway Safety Planning (OHSP)*

Michigan, in a similar situation to Wisconsin, has a statutory ban on sobriety checkpoints. The Office of Highway Safety Planning began a pilot study of PAS in June, 2000. Since Michigan cannot use sobriety checkpoints, the officers were asked to evaluate the sensors in their everyday duties, documenting their activities. The goal was to determine the effectiveness of the sensors in "routine" patrols for impaired drivers.

The Marquette City Police and the Marquette County Sheriff departments were chosen because of their location in the Upper Peninsula (to test effectiveness in cold weather). The Oakland County Sheriff Department participated because of their strong alcohol enforcement programs and full-time team dedicated to alcohol enforcement. Also selected to participate was the Western Michigan University Department of Public Safety. Along with officers from each of the departments selected, several Michigan State Police troopers were also selected to participate in those same areas.

Twenty-three officers attended an eight-hour training session prior to using the sensors. The training consisted of the proper use of the sensor, legal issues, how to complete minor repairs, and reporting requirements. They also were required to work with the media during the use of the program and informed of the importance of the

media aspect. After completing the training the officers could trouble shoot any problems, calibrate the instrument, and instruct other officers in use of the device for the future.

The program ran from June 2000 – March 2001. The officers completed evaluation reports: the majority of the officers felt that the sensor was a benefit to them as it enhanced their abilities to detect alcohol, however, most officers could detect its presence prior to the sensor being activated. The sensor did confirm their suspicions and at that time, the officers would proceed with their normal investigations.

Officers viewed the sensor as another "tool" at their disposal. In their opinion, the sensor was extremely useful when screening a large group of underage drinkers. The officers also stated that the sensor was useful in determining if there was open alcohol present without having to personally smell contents of containers (with the potential for danger because of the different types of drugs that are being manufactured today). Some citizens mentioned Fourth Amendment violations. During the initial training, the officers learned that the sensor did not violate the Fourth Amendment because it is not considered a search – it is a "plain view" situation.

Officers were encouraged to advise their local prosecutors of the use of the sensor. Every prosecutor in the pilot area accepted the sensor as an "extension of the officer's nose." During training, the officers were instructed that this device is not accepted as evidence in court. An Oakland County Deputy stated that it was brought up in a preliminary exam but the defense attorney did not challenge it. Not one case was documented where the sensor was challenged.

Some adjustments will be recommended to the manufacturer of the sensor as a result of this pilot. The switches can be improved for easier use and the bulb strength should be increased. The manufacturer has received these same comments from others and adjustments are in progress.

The majority of the public's response was supportive. The media supported the program and published many articles in local newspapers and television.

**Source: Michigan Office of Highway Safety and Planning, http://www.ohsp.state.mi.us/news/SummerSafetyNetwork2001.htm*

Additional comments on the Passive Alcohol Sensor Program from the Michigan State Police:

Staff Note: Wisconsin State Patrol staff conducted follow-up by email and telephone in November 2002 with Sergeant Perry Curtis, Michigan State Police (MSP) regarding their experience and opinions of the passive alcohol sensor program. The following comments were noted:

- Officers from local agencies, Sheriff Deputies and State Troopers participated in the evaluation. All officers received 8 hours of training consisting of how to use the sensor, legal issues concerning the sensor, minor repair and calibration of the sensor, and evaluation reporting requirements. Training on use of the devices was provided by OHSP, not the manufacturers or law enforcement.
- Neither the MSP nor the OHSP did any laboratory testing of the devices.
- MSP used the PAS flashlight device by PAS Systems International but Sgt. Curtis did not know why that particular device was chosen.
- Most officers found that the sensor was an additional tool. Most officers reported that they usually detected the odor of intoxicants prior to activating the sensor, though some reported that the sensor did indicate alcohol when they did not sense its presence with their nose.
- The sensor was helpful in detecting alcohol in open containers.
- The sensor received a tremendous amount of media coverage for impaired driving, which is hard to get.
- Negative comments about the sensor included that the switches were hard to activate, that the light portion of the sensor was too dim, and that it was not very useful in cold weather. The biggest concern for officers was that the sensor needed to be very close to the subject's mouth to get a sample.
- The evaluation showed that the sensor is not for all officers, but that it is an additional tool for an officer interested in removing impaired drivers from the highways.
- OHSP is buying all of the sensors being used by law enforcement in the state. The Michigan State Police are not purchasing any of the instruments. MSP don't feel the sensors are cost effective; they are purchasing preliminary breath testers (PBT). A PBT can be used as a screener and also as a breath tester with a BAC result.
- Officers testing the device sent in quarterly reports on the devices to OHSP.
- Sgt. Curtis stated that the MSP would not be purchasing these devices because they were "not cost effective" and they stopped working only after a short time.
- Sgt. Curtis only used his device when giving talks, not when out on the road.
- The use of the devices is promoted by the Office of Highway Safety and Planning (OHSP), not law enforcement; OHSP ensured that there was wide media coverage.
- There appeared to be no conflict with the 4th amendment; it became a non-issue.

The Use of Passive Alcohol Sensors in Conjunction with Sobriety Checkpoints in Other States and General Deterrence Value

Passive alcohol sensors are sometimes used as a tool to assist law enforcement as part of random testing conducted at roadblocks or sobriety checkpoints. Again, note that alcohol sobriety checkpoints are prohibited in Wisconsin State Statutes 349.02(2)(a). Therefore, use of passive alcohol sensors in Wisconsin has been primarily limited to routine traffic enforcement. **Therefore, no direct correlation should be drawn between the results of these studies and Wisconsin's experience in the field**. **These studies cannot be used as arguments to support or refute the possible application of sobriety checkpoints in Wisconsin.** Rather, these studies should only be used to document how passive alcohol sensors have been used with sobriety checkpoints in other states and their reported results.

***Ferguson, S.A.; Wells, J.K.; and Lund, A.K. 1995. The role of passive alcohol sensors in detecting alcohol-impaired drivers at sobriety checkpoints. Alcohol, Drugs, and Driving 11:23-30.**

Police officers using standard checkpoint procedures identified 26 percent of drivers with 0.05-0.10 percent BACs and 55 percent of drivers with BACs of 0.10 percent or greater. When officers used passive sensors, these detection rates increased to 39 percent and 71 percent, respectively. The authors noted that research on checkpoints demonstrates their value in creating general deterrence. However, the authors also stated that passive alcohol sensors are unlikely to lead to the detection of all alcohol-impaired drivers at sobriety checkpoints due to performance problems (e.g., the sensor samples a mixture of ambient air and breath which dilutes the concentration of alcohol in the sample and wind can also affect the sample).

***Farmer, C.M.; Wells, J.K.; Ferguson, S.A.; and Voas, R.B. 1998. Field evaluation of the PAS III passive alcohol sensor. Journal of Crash Prevention and Injury Control 1:55-61.**

Data from a 1996 nationwide survey, in which 5,392 drivers were evaluated for alcohol using both PAS III (a passive sensor housed in a flashlight) and evidential breath test devices, have allowed the determination of appropriate criteria at various blood alcohol concentrations (BAC) for detecting impaired drivers in the field. According to the results of this study, the PAS III identified about 75% of the drivers with BACs at or above 0.10% and 70% at or above 0.08%. The authors claim that this is a "vast improvement" over the detection rate by law enforcement officers that do not use passive alcohol sensors. The authors noted that because females expel smaller volumes of breath when speaking than males, PAS devices are potentially less reliable for females than males. It was noted that correlation values were "significantly lower for females than for males" (0.64 versus 0.72 using chi square test).

***Foss, R.D.; Voas, R.B.; and Beimess, D.J. 1993. Using a passive alcohol sensor to detect legally intoxicated drivers. American Journal of Public Health 83:556-60.**

Based on 1,145 cases of randomly stopped drivers in Minnesota, Foss et al found that at four BAC levels (.10, .08, .05, .02) decisions using the passive alcohol sensors were correct in more than 95 percent of the cases. Measurements were taken easily and quickly with the passive sensor whose readings "correlated very strongly (r = 0.87) with the evidentiary device. The authors noted that passive alcohol sensors add value in processing motorists at sobriety checkpoints as well as providing general deterrence.

Homel, R. Policing the Drinking Driver: Random Breath Testing and the Process of Deterrence. Sydney, Australia: Federal Office of Road Safety; 1986.
-and-
Homel, R. Crime on the Roads: Drinking and Driving. Australian Institute of Criminology; 1989 Conference Proceedings on Alcohol and Crime; Canberra, Australia.

An extensive, random breath testing campaign involving 923,272 preliminary breath tests (one test for every three licensed drivers) was conducted in South Wales, Australia from December 1982 to December 1983. The campaign took place utilizing sobriety checkpoints and routine highway patrol efforts and was combined with a large-scale media blitz. No attempt was made to emphasize the penalties as the focus was placed on the threat of arrest and humiliation for those who would be caught. Survey data was collected within the first few months of the program supporting the thesis that there was a deterrence effect. For example, 40 percent of respondents claimed that random breath testing made it easier to resist the pressure to drink in a group situation. It is also interesting to note that the average number of drivers killed with a blood concentration of .05 or more dropped 36 percent in the four years after the program.

Although this study used preliminary breath tests (as opposed to passive alcohol sensors), it still underscores the fact that overt and highly publicized uses of breath testing technology can affect drinking and driving behaviors solely based on the perceived risk of being caught.

***Jones, I.S. and Lund, A.K. 1986. Detection of impaired drivers with a passive alcohol sensor. Journal of Police Science and Administration 14:153-60.**

In October and November 1984, passive sensors were used at checkpoints in Charlottesville, VA. According to the evaluation, the use of the sensor significantly improved the detection rate of impaired and intoxicated drivers. When the sensor was not in use, police officers detected 45 percent of the drivers with BACs of .10 and greater and 24 percent of drivers with BACs between 0.05 and 0.099. When the

passive alcohol sensor was used, these detection rates reportedly increased to 68 percent of drivers with BACs of .10 or greater and 45 percent of drivers with BACs between 0.05 and 0.099. The authors also noted that the use of the passive alcohol sensor reduced the false positive rate. For drivers with BACs between 0.02 and 0.049, the proportion detained unnecessarily dropped from 18 percent to 8 percent. The proportion of drivers with very low BACs detained (between 0.00 and 0.019) dropped from 2 percent to 1 percent. The authors concluded that the results show that a passive alcohol sensor can increase both the effectiveness and the efficiency of drunk driving enforcement efforts. In turn, this may have some effect on the public's perceived likelihood of detecting alcohol-impaired drivers.

***Lund, A.K. and Jones, I.S. 1987. Detection of impaired drivers with a passive alcohol sensor. Proceedings of the 10th International Conference on Alcohol, Drugs, and Traffic Safety, 379-82. Amsterdam, the Netherlands: Elsevier Science Publishers B.V.**

The authors examined the impaired driver detection rates with and without passive sensors of officers in San Diego, CA and Chattanooga, TN working special DUI patrol. Special patrols use officers dedicated exclusively to DUI enforcement, and officers selected for special patrols typically have more extensive experience and training in DUI detection than other officers. According to the results, officers were more effective detecting drivers with BACs above 0.10 when they had the sensor than when they did not. However, the authors concluded that the difference was not as statistically significant or impressive as the Charlottesville checkpoint study (Jones, I.S. and Lund, A.K. 1986). Moreover, the PAS had "no effect" on the detection of drivers with BACs between 0.05 and 0.10.

According to the authors, the "most striking finding" was the very high effectiveness of the Chattanooga officers, who arrested 94 percent of the drivers with BACs over 0.10 with the sensor and 88 percent without it compared to 63 and 56 percent for San Diego officers. The authors indicated that the high arrest rate was also high among drivers with BACs between 0.10 and 0.15. The false positive rate was reported to be very low in both patrols. In San Diego, only 4 percent of the drivers with BACs under 0.05 were arrested without the sensor, and only 3 percent with the sensor (again, this difference does not appear to be statistically significant). In Chattanooga, only one percent of drivers with low BACs were arrested.